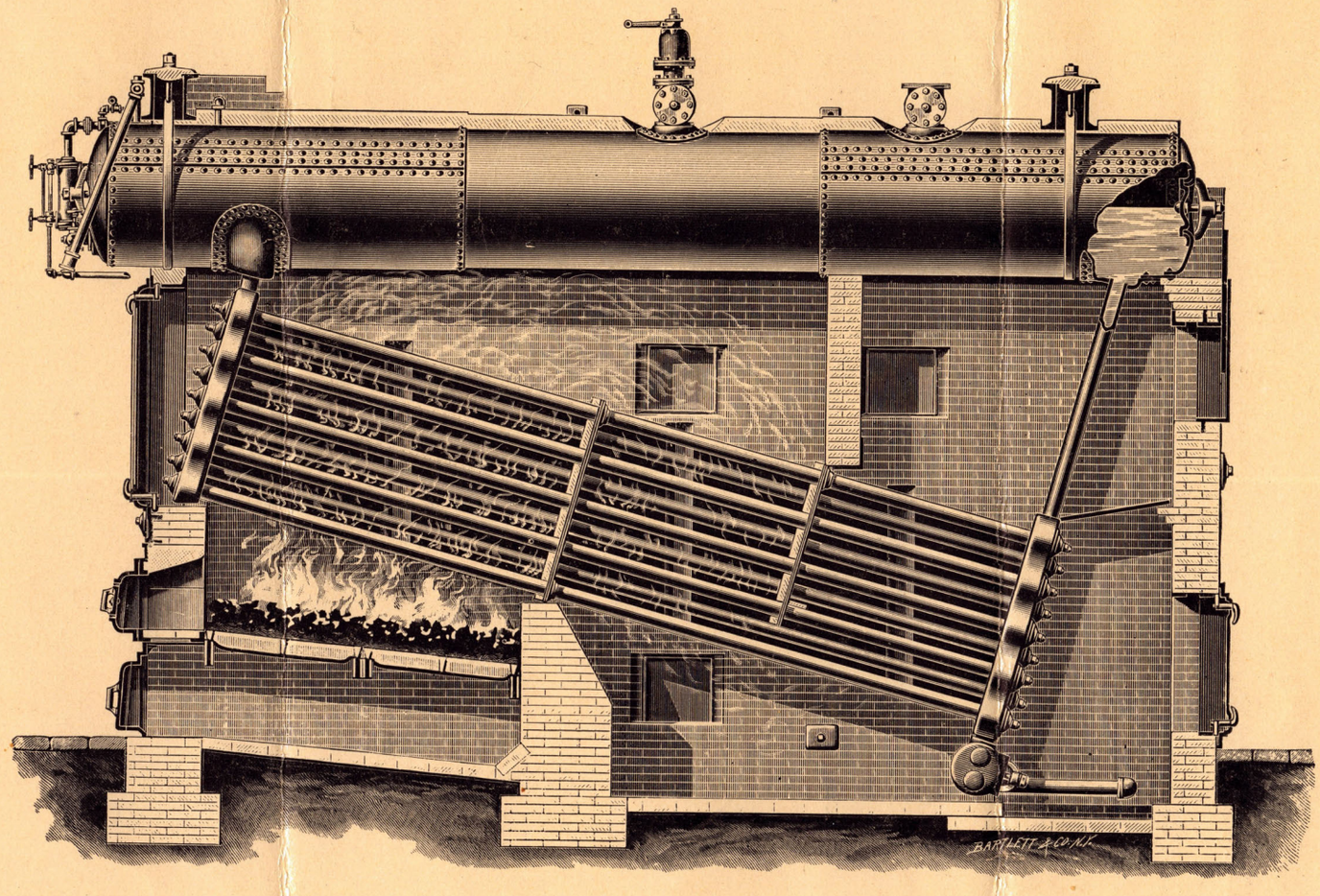
SP ATION

THE BABCOCK & WILCOX CO. NEW YORK.
STEAM
1856
1910
BABCOCK & WILCOX. LIMITED. LONDON.
HIGH PRESSURE



Vertical Headers

The Babcock & Wilcox Co.

WATER TUBE STEAM BOILERS.

Cable Address
NEW YORK "GLOVEBOXES"
ALL FOREIGN OFFICES "BABCOCK"

NEW YORK,
85 Liberty St.

BRANCH OFFICES

BOSTON, 40 Post Office Square
PHILADELPHIA, North American Building.
SAN FRANCISCO, 99 First Street.
PITTSBURGH, Farmers Deposit Bank Bldg.
NEW ORLEANS, 533 Baronne St.
DENVER, 435 Seventeenth St.
SALT LAKE CITY, 313 Atlas Block.
PORTLAND, OREGON, 446 Wells-Fargo Bldg.

CHICAGO, 1207 Marquette Bldg.
ATLANTA, GA. 1132 Candler Bldg.
CLEVELAND, 706 New England Bldg.
SEATTLE, Mutual Life Bldg.
HAVANA, CUBA, 116½ Calle de la Habana.
LOS ANGELES, 321 Trust Bldg.
CINCINNATI, O. Traction Bldg.
HOUSTON, TEXAS, Land & Trust Bldg.

No. 2419-B

Boston, Mass. December 21st, 1910.9

WE PROPOSE TO FURNISH TO

OFFICE — Beverly Gas & Electric Co.

Beverly, Mass.

HORSE-POWER AND ARRANGEMENT

One 440 H.-P. WROUGHT-STEEL SECTIONAL VERTICAL HEADER BOILER

(ONE H. P. EQUALS 34½ LBS. OF WATER EVAPORATED PER HOUR FROM AND AT 212° FAHR.)

HAVING A TOTAL OF 4402 SQUARE FEET OF HEATING SURFACE AND 75.8 SQUARE FEET OF GRATE SURFACE. ARRANGED TO BE SET ~~BOILER IN BATTER AND BOILER~~ SINGLY

AS PER THE FOLLOWING SPECIFICATION

HEATING SURFACES

The heating surface of the boiler to consist of 2 steam and water drum 42 inches in diameter and 20 feet 4 inches long, placed above and connected to a set of 18 sections of tubes, each section consisting of 12 tubes, four inches in diameter and 18 feet long. The lower ends of the sections to be connected to a mud drum. The connections between all parts to be made by expanding wrought tubes into bored tube seats.

WROUGHT STEEL

SPECIFICATION OF OPEN HEARTH STEEL

All wrought metal for pressure parts, except tubes, to be of the best Open Hearth steel, stamped with maker's name, and having a tensile strength of 56,000 to 62,000 pounds per square inch, to show an elongation of not less than 25 per cent, in a parallel test piece of 8 inches accompanied by a reduction in area of at least 50 per cent.; to endure bending double upon itself both before and after being brought to a flanging heat and quenched.

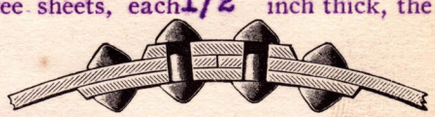
FORGINGS

All forgings for pressure parts to be made from Open Hearth steel of from 52,000 to 58,000 pounds tensile strength, and formed by hydraulic power.

DRUM CONSTRUCTION

THICKNESS OF SHEETS
RIVET SEAMS

The cylindrical portion of the drum to be made of three sheets, each 1/2 inch thick, the longitudinal seams butt strapped inside and out. The seams to have two rows of rivets passing through both straps and the shell, and two rows through the shell and inner strap only, the butt straps to be bent to a proper radius in a hydraulic press. The circular seams lap-joint, single riveted.



FITTING UP

All holes for double-riveted seams to be punched 3/16 inch smaller than the diameter of rivets to be used, and drilled out to full size after the sheets are rolled and assembled with their butt straps.

ASSEMBLING

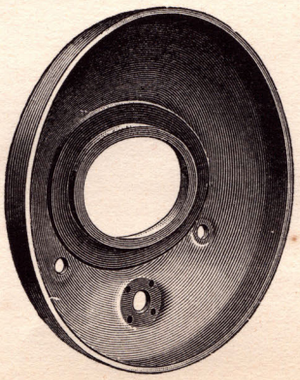
After drilling, the straps are to be removed, all burrs cleaned off and the plates assembled, metal to metal, with parallel turned bolts fitting the holes, before riveting.

Each course to be built independently to template. The various courses and their heads to be assembled by a hydraulic forcing press.

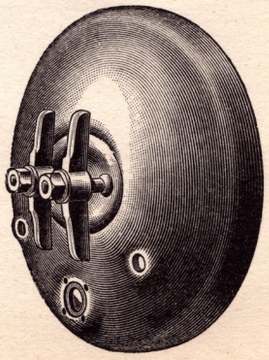
HYDRAULIC RIVETING

All rivets to be driven by hydraulic pressure and held until cool.

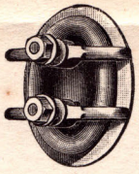
DRUM HEADS



All drum heads to be fitted with manholes, 11 inches by 15 inches. The heads to be hydraulic forged at a single heat, with manhole ring and stiffening plate in position, and to have flat raised seats for stand pipe and feed connections. The edges of head and manhole face to be turned off true.



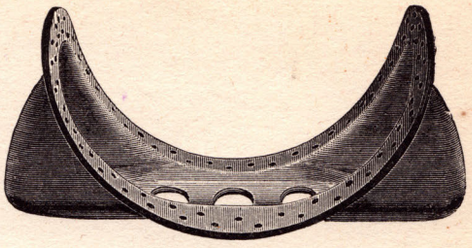
MANHOLE FITTINGS



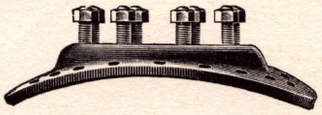
The manhole plate and guards to be of forged steel. The plate to be faced and turned to a true oval to fit head.

DRUM NOZZLES

The drum nozzles to be of forged steel, faced, and fitted with stud bolts, with taper threads.



CROSS BOXES

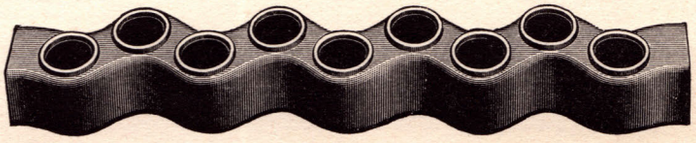


The drum cross boxes to be hydraulic forged from a single sheet without seams or rivets.

SECTIONS

TUBES

The sections to be built up of 4-inch charcoal iron tubes, or of hot finished, seamless Open Hearth steel tubes, as buyer may prefer.



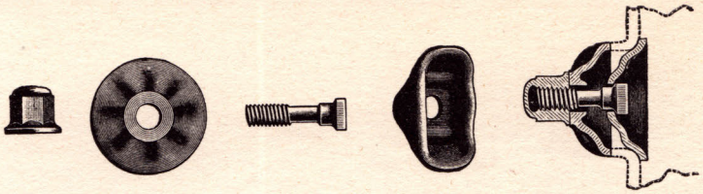
HEADERS

The tubes to be expanded into forged steel headers of serpentine form, disposing the tubes in a staggered position when assembled in the furnace.

HAND-HOLE

A hand-hole of sufficient size to permit the cleaning, removal and renewal of a tube to be placed opposite each tube end, said hand-hole to have a raised seat milled off to a true surface.

OUTSIDE HAND-HOLE FITTINGS NOT FURNISHED



The hand-holes to be closed on the outside by a forged steel cap milled to a true surface, and to be held in position by a forged steel safety clamp, closing the hand-hole opening from the inside, and secured by a ball-headed bolt to insure correct alignment. All joints to be made tight, metal to metal, without packing of any kind.

INSIDE HAND-HOLE FITTINGS

Or, if preferred, headers will be provided with elliptical hand-holes, faced inside and closed by an inside fitting plate held to its seat by a stud and secured by a forged steel binder and nut. The joint between plate and header to be made with a thin gasket.

MUD DRUMS

BLOW-OFF

HAND HOLES

The mud drum to be a forged steel box 7¼ inches square and of proper length to be connected with all of the sections in the boiler by means of wrought nipples expanded into counterbored seats. To be tapped for blow-off connections and furnished for hand holes for cleaning. The hand holes to be faced inside and closed by an inside fitting forged plate with stud, secured by a forged steel guard and nut.

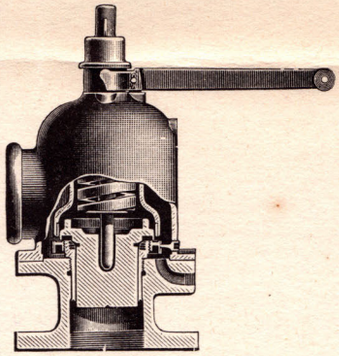
Cast iron mud drums 12 inches in diameter can be supplied if buyer prefers.

CONNECTING TUBES AND NIPPLES

CONNECTING TUBES AND NIPPLES

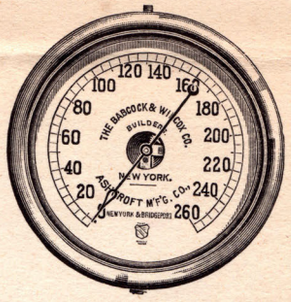
The tubes and nipples forming connections between steam drums and sections and between sections and mud drums are to be of hot finished, seamless, Open Hearth steel of heavy gauge.

VALVES AND FITTINGS



SAFETY VALVES

Each boiler to be provided with 2 "Consolidated Co's" nickel-seated safety valves, 4½ inches diameter, set to blow at 200 pounds (unless otherwise ordered).

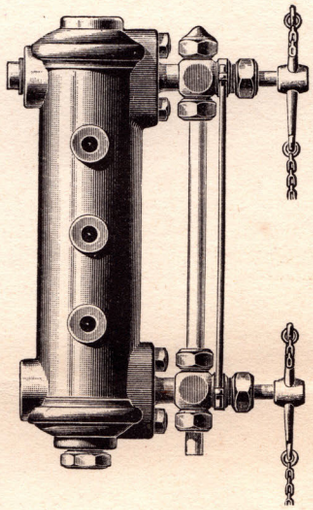


STEAM GAUGE

One Ashcroft steam gauge, with 12-inch dial.

WATER COLUMN

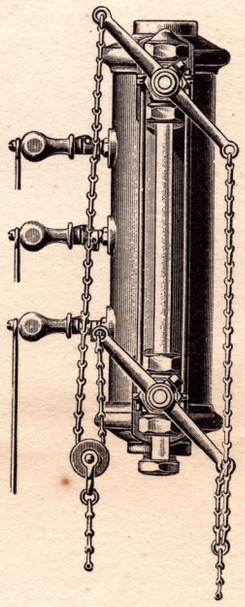
One water column fitted with extra-heavy bronze mountings for glass water gauge, with special shut-off device operated from fire room floor, to allow renewal of glass when under pressure.



WATER GAUGE

TRY COCKS

Three try cocks with lifting handles for operating from fire room floor, and fitted with steam metal valves.

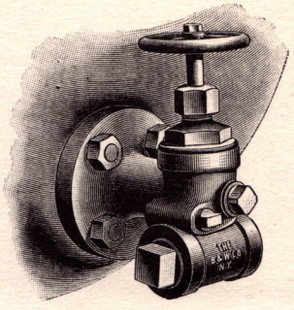


BLOW-OFF

Independent blow-off pipes for bottom of column, and glass gauge, to be carried down the front, terminating with valves at height of hand.

COMBINATION STOP AND CHECK

A combination stop and check valve of heavy bronze pattern, to be flanged directly to the drum head, operating automatically in case of rupture of feed piping.



STOP VALVE CHECK VALVE

One stop valve for feed, 2½ inches diameter, and one check valve for feed, 2½ inches diameter, to be placed hand high from boiler-room floor. Two A.P. Cocks 2½"

BLOW-OFF

Two 2½ inch blow-off valves, with loose sleeve for blow-off pipe, for building into brickwork, to allow for expansion and contraction.

CLEANING VALVES

Two ¾ inch stop valves connected to steam or safety-valve outlet, for steam dusting hose connection.

PIPE AND FITTINGS

Heavy brass pipe, and fittings, to be used for connecting all the above mountings to the boiler.

CROSS PIPE, FOR MULTIPLE DRUM BOILERS.

CROSS PIPES

When two or more drums are used on one boiler, drums are to be connected by cross pipe having flanged outlet for main steam connection.

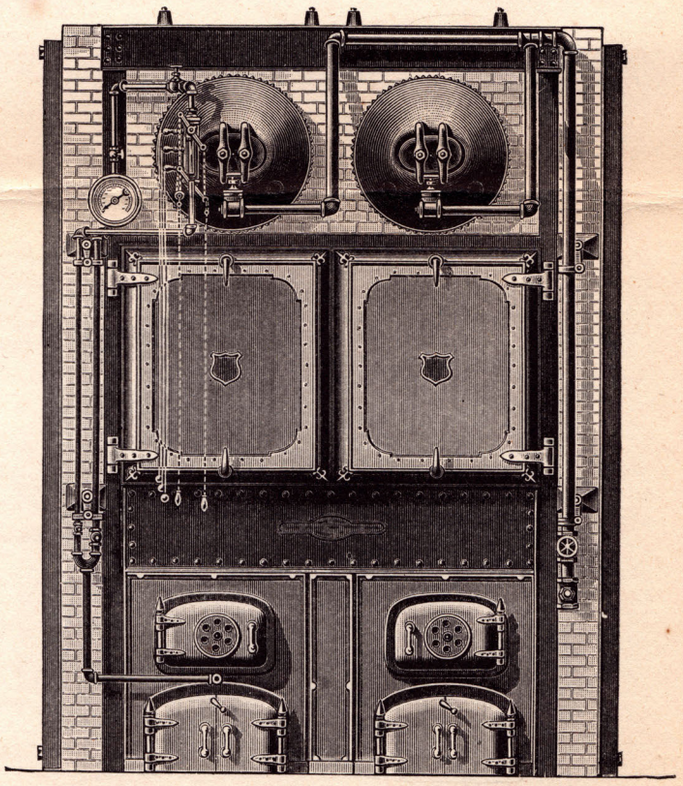
MAIN STEAM OUTLET

STEAM OUTLET

Main steam outlet to be 10 inches diameter, 17½ inches flange or smaller.

BOILER SUPPORTS AND FRONT

Each boiler to be suspended, at front and rear, from wrought-iron supporting frames, entirely independent of the setting, to allow for contraction and expansion without straining either the boiler or the brick work, and to allow of repairs or renewal of the latter without disturbing the boiler or its connections.



TUBE DOORS

The boiler front to be fitted to front supporting frame and to be of ornamental design. To be provided with large doors for access to front headers and panels above fire fronts.

FIRE FRONTS

The fire fronts to have independent frames for fire doors which are to be bolted on, and ash doors fitted with blast catches. All joints to be fitted and faces of doors planed.

FURNACE AND WALL FIXTURES

FURNACE FITTINGS

Dead plates and supports, the plates are to be arranged for a fire-brick lining.

Fire-brick arches for fire-door openings.

GRATES

A full set of grate bars and bearers, the latter to be fitted with expansion sockets for side wall.

FLAME BRIDGES

Two sets of flame bridge plates with necessary fastenings, and special fire-brick for lining the same.

BRIDGE WALL GIRDER

One bridge wall girder for hanging bridge, with expansion plates for side walls.

CLEANING DOORS

A full set of cleaning and ash doors for side walls, giving access to all parts for exterior cleaning.

DAMPER

One swing damper and frame.

BUCKSTAYS ETC.

All the necessary buckstays, tie and anchor rods, anchor plates and lintels for securing all parts in position.

TOOLS

1 steel wrench for hand-hole nuts.
1 Lagonda turbine tube cleaner.
1 set of fire tools, consisting of poker, slice bar and hoe.
1 set of best steam hose and cleaning pipe with special nozzle for blowing dust and soot from the exterior of tubes.

MATERIAL AND WORKMANSHIP

All materials to be of the best quality, each specially adapted to the service required, and the workmanship to be first-class in every particular.

WORKING PRESSURE

The boiler, as specified, will carry 200 pounds pressure, if desired.

TESTING

All pressure parts to be tested and made tight under hydrostatic pressure before leaving shop, as follows:

Sections, 400 pounds. Drums, 300 pounds. Mud drums, 300 pounds.

When erected complete on foundations, the whole structure to be tested and made tight at 300 pounds pressure. Purchaser is to supply water for hydrostatic test.

WEIGHT, SPACE AND BRICK WORK

WEIGHT

Approximate shipping weight, 82,600 pounds.

SPACE

The space occupied by boiler, including brick work, 19 feet 9 inches long, 13 feet 8 inches wide, 18 feet 10½ inches high to the top of steam flange.

The space occupied by ---------, including brick work, ------ feet ---- inches long, --- feet --- inches wide, ----- feet ---- inches high to the top of steam flange.

BRICK WORK

The brick work (to be provided by the purchaser) will require about 5850 fire bricks and 21,400 red bricks, not including foundations nor flues, measured from 3 inches below floor line and including paving in ash pits and behind bridge wall.

ERECTING

Full drawings and directions for erecting to be furnished, and services of man to superintend erection—board and traveling expenses and cost of transportation of tools to and from place of erection, to be paid by ~~purchaser~~ us, ~~who is~~ we also to furnish the ordinary labor. ~~It is expressly understood and agreed, however, that the purchaser will indemnify this Company and save it harmless from all liability for any injury or damages to the persons performing such ordinary labor.~~

DELIVERY

To be delivered ~~f. o. b. New York.~~ Changed, see accompanying letter

The price for boiler and superheater above named is based on a freight rate, as follows, 91,400 pounds from Bayonne, N.J. to Beverly, Mass at 20¢ per 100 pounds. Should a different freight rate be in force at the time the material specified to be furnished is ready for shipment, it is to be understood and agreed that if such freight rate be less than above mentioned, the saving in freight resulting therefrom shall be paid to the purchaser by The Babcock & Wilcox Company, but if the new freight rate be greater than the above mentioned rate, the increase in freight shall be paid by the purchaser to The Babcock & Wilcox Company.

PRICE

Prices as per accompanying letter.

TERMS

One-half payable on presentation of sight draft with shipping receipt. Balance, sixty days from shipment. Foreign and mining shipments on presentation of bills of lading.

Payable in New York Exchange, free of expense to us for collection charges.

DELIVERY LIMIT

Deliveries subject to strikes, accidents or causes beyond our control.

This proposal will be void, unless accepted within thirty days.

THE BABCOCK & WILCOX CO.

Richard Robinson

District Sales Manager.

ORDER

(Printed in Copying Ink)

Job .....
(B. & W. Co's Number)

THE BABCOCK & WILCOX CO.,
85 LIBERTY ST., NEW YORK.

Gentlemen :

We hereby accept your proposition No. 2419-B dated December 21st, 1910.

for one 440 horse-power B. & W. Boiler ,

Drawings Nos. ....., ..., ..., accompanying your proposal are hereby / not accepted.

Charcoal Iron or Seamless Steel Tubes ?

Cast Iron or Wrought Steel Mud Drum ?

Safety valve to be set to blow at ..... pounds. (150 pounds unless otherwise ordered.)

The fuel will be

If ordinary flat grates are to be used, give grate-bar opening

For settlement of any undetermined details please communicate with

at

Date to be shipped

Ship to

Via

NOTE : State railroad on which most convenient delivery can be made and if delivery is to be made at any special siding or freight station.

Signature .....

Form 105—6, April, 1910.

Babcock & Wilcox Co
Dec 28th 1910 B. & W. Boiler
440 H.P. 200 lbs. 100 deg. S. # 6,6[illegible]

#5 Boiler